

Appl. No. 10/081,985
Amdt. dated 12/08/2003
Reply to Office action of 09/23/ 2003

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.(currently amended) A process for forming a dielectric anti-reflection coating, having a final thickness, comprising the steps of:

(a) depositing a dielectric layer having a thickness that is at most half said final thickness;

(b) then exposing said dielectric layer of step (a) to a gaseous plasma for a period of time; and

repeating steps (a) and (b), with no intervening layers, until a total layer thickness equal to said final thickness has been achieved.

2.(original) The process described in claim 1 wherein said gaseous plasma is nitrous oxide gas.

3.(original) The process described in claim 1 wherein said gaseous plasma is selected from the group consisting of helium, argon, ammonia, oxygen, and nitrogen.

4.(currently amended) The process described in claim 1 wherein each of said dielectric layers is selected from the group consisting of silicon oxynitride and silicon oxycarbide.

5.(original) The process described in claim 1 wherein steps (a) and (b) are repeated between 2 and 5 times.

6.(original) The process described in claim 1 wherein said final thickness is between

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about 500 and 2,000 Angstroms.

7.(original) The process described in claim 1 wherein said period of time is between about 5 and 20 seconds.

8 .(currently amended) A process for forming a dielectric anti-reflection coating, having a predetermined refractive index, extinction coefficient and final thickness, comprising:

through simulation, determining composition, thickness, and the effects of surface treatment for each of a number of layers of said dielectric whereby said number of layers have a total thickness equal to said final thickness and a structure formed of said number of layers has said predetermined refractive index and extinction coefficient; then

(a) depositing a layer of dielectric material having the thickness and composition determined through said simulation;

(b) then exposing said layer of dielectric material of step (a) to the surface treatment determined through said simulation; and

repeating steps (a) and (b), with no intervening layers, until said number of layers has been deposited.

9.(currently amended) The process described in claim 8 wherein each of said dielectric layers is selected from the group consisting of silicon oxynitride and silicon oxycarbide.

10.(canceled)

11.(original) The process described in claim 10 wherein said gaseous plasma is selected from the group consisting of nitrous oxide, helium, argon, oxygen, and nitrogen.

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12.(original) The process described in claim 10 wherein said period of time is between about 5 and 20 seconds.

13.(original) The process described in claim 8 wherein said number of layers is between 2 and 5.

14.(original) The process described in claim 8 wherein said final thickness is between about 500 and 2,000 Angstroms.

15.(original) The process described in claim 8 wherein step (b) further comprises measuring refractive index and extinction coefficient and then using said measurements to modify said thickness, composition, and surface treatment conditions during subsequent repetitions of steps (a) and (b).

16.(currently amended) A process for forming a dielectric anti-reflection coating, having a predetermined refractive index, extinction coefficient and final thickness, comprising the steps of:

(a) depositing a dielectric layer having a thickness that is at most half said final thickness;

(b) then exposing said dielectric layer of step (a) to a gaseous plasma for a period of time;

repeating steps (a) and (b), with no intervening layers, thereby forming a stack of layers, until a total layer thickness equal to said final thickness has been achieved;

after each stack has been formed, determining refractive index and extinction coefficient values for that stack; and

based on said determined values, adjusting conditions during subsequent steps whereby, after said final thickness has been achieved, a final stack having said pre-

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determined refractive index and extinction coefficient is formed.

17.(currently amended) The process described in claim 16 wherein each of said dielectric layers is selected from the group consisting of silicon oxynitride and silicon oxycarbide.

18.(original) The process described in claim 16 wherein said gaseous plasma is nitrous oxide gas.

19.(original) The process described in claim 16 wherein said gaseous plasma is selected from the group consisting of helium, argon, ammonia, oxygen, and nitrogen.

20.(original) The process described in claim 16 wherein steps (a) and (b) are repeated between 2 and 5 times.

21.(original) The process described in claim 16 wherein said final thickness is between about 500 and 2,000 Angstroms.

22.(original) The process described in claim 16 wherein said period of time is between about 5 and 20 seconds.

23.(currently amended) The process described in claim 16 further comprising, prior to depositing any layer, determining, through simulation, composition, thickness, and the effects of surface treatment for each layer of said final stack.

24-26 (canceled)